Chapter 1
Introduction

Based on the shortcomings of traditional BMPs discussed in Volume I, Chapter 2, Maine DEP has restructured its use of BMPs to focus on meeting four major objectives:

1. **Effective pollutant removal:** BMPs must effectively remove the fine particles that carry much of the nutrient and heavy metal load, as well as dissolved pollutants, and hydrocarbons. BMPs that only remove coarse sediments are no longer available.

2. **Cooling:** BMPs discharging within a stream, brook or river watershed must effectively cool down (22°C or cooler) stormwater runoff before discharging it to adequately protect aquatic life. This may also be accomplished through measures to avoid heating of the stormwater.

3. **Channel protection:** BMPs discharging within a stream, brook or river watershed must slowly release stormwater runoff from a site to avoid destabilization and resulting sedimentation of receiving stream channels. This can also be accomplished through site planning and operation that minimizes the volume and rate of discharge of stormwater by minimizing impervious area, maximizing infiltration and evapo-transpiration, and maximizing time of concentration of storm flows.

4. **Flood control:** Traditional flood control detention for large, infrequent storms will still be necessary for some sites to avoid flooding of downstream infrastructure.

These objectives are discussed further in Volume I, Chapter 1. DEP is recommending four types of BMPs that if sized appropriately, will provide effective pollutant removal, cooling and channel protection. In some instances they may also provide flood control benefits without the need for a pond structure. The purpose of this volume is to provide information on these BMPs, as well as other BMPs that may be used for pretreatment and quantity control. The BMPs covered in this manual are outlined below:

BMPs to Control Flooding - These BMPs can be used to control peak flows from a development. Peak control BMPs are discussed in the following chapter(s):

Chapter 3: Peak Control/ Detention Structures

BMPs to Meet Water Quality Objectives (Pollutant Removal, Cooling & Channel Protection) - These four BMPs are recommended to meet the BMP standards for discharges to river, stream and brook watersheds and can also be used to meet phosphorus standards for lakes. The proper design of these BMPs will meet objectives for pollutant removal, cooling and channel protection. Water quality BMPs to meet water quality objectives are discussed in the following chapter(s):

Chapter 4: Wet Ponds
Chapter 5: Buffers
Chapter 6: Infiltration BMPs
Chapter 7: Filtration BMPs

Conveyance and Distribution BMPs - These BMPs can be used to help convey and control flows entering one of the four water quality BMPs. Conveyance and distribution BMPs are discussed in the following chapter(s):

Chapter 8: Conveyance and Distribution BMPs
- Vegetated Swales
- Flow Splitter
- Level Spreader

Separator BMPs - Separator BMPs are primarily designed as pretreatment devices to remove sediment and oil and grease from runoff before it discharges into one of the four water quality BMPs. Separator BMPs are discussed in the following chapter(s):

Chapter 9: Separator BMPs
- Water Quality Inlet
- Oil/Grit and Oil/Water Separator
- Proprietary Systems

Low Impact Development (LID) BMPs - LID can be used to minimize the impacts of development during the planning phase, which can minimize the need for structural BMPs. It is important to limit the size of an area draining to a LID BMP and to treat at the source. LID BMPs are discussed in the following chapter(s):

Chapter 10: Low Impact Development (LID)
- Planning for LID
- LID Techniques

Operation and Maintenance - Operation and maintenance is crucial to the performance of any BMP. This needs to be incorporated into the design phase to be most effective. Operation and maintenance criteria are discussed in the following chapter(s):

Chapter 11: Designing for Operation and Maintenance

Table 1-1 summarizes the applicability of each BMP. Alternative stormwater management systems to the four proposed by DEP may be used if they will provide equivalent pollutant removal, cooling and channel protection. DEP also strongly encourages the incorporation of low impact development site planning concepts with any development. LID may reduce the scale and need for structural BMPs.

Table 1-1: Best Management Practice Type Selection Matrix

BMP Type	Best Management Practice	Selection Criteria: Drainage Area (Acres)					Soil Hydrologic Group				Depth to High Water Table/ Depth to Bedrock		Land Area		Applicability					Design Restrictions: Proximity to Wells (ft)	Proximity to Property Lines	Wetland, Stream, Lake, River Setback	Upgradient Building Setback	Downgradient Building Setback	Steep Slope (>3:1) Setback	Slope
		0-5	5-10	10-25	25-50	50+	A	B	C	D	0-3 ft	3+ ft	Requires Large Land Area	Requires Small Land Area	Peak Control (Flood Control Standard)	WQ Control (BMP Standard)	Pretreatment	Conveyance	Distribution							
Detention Basin	Detention Basin			●	●	●	●	●	●	●	●	●	●		●					100’	25’	75’	20’	50’	50’	
Wet Pond	Wet Pond			●	●	●		●	●	●	●	●	●		●	●				300’	25’	75’	20’	100’	50’	
Buffer	Vegetated Buffer with Slope Lip Level Spreader	●					●	●	●	●	●	●	●		●	●										<15%
	Adjacent to Downhill Side of Road	●					●	●	●	●	●	●	●		●	●										<20%
	Ditch Turn-Out	●					●	●	●	●	●	●	●		●	●										<15%
	Adjacent to Residential, Large Pervious or Small Impervious	●					●	●	●	●	●	●	●		●	●										<15%
Infiltration	Drywell	●					●	●				●		●		●				300’	25’	25’	10’	100’		
	Infiltration Trench	●	●				●	●				●	●			●				300’	25’	75’	20’	100’		
	Infiltration Basin		●	●	●		●	●				●	●		●	●				300’	25’	75’	20’	100’		
Filter	Vegetated Soil Filter		●				●	●	●	●		●		●		●				100’	25’	75’	20’	25’	25’	
	Bioretention Cell	●					●	●	●	●		●		●		●				100’	25’	75’	20’	25’	25’	
Conveyance and Distribution	Vegetated Swales						●	●	●	●							●	●								
	Flow Splitter	●	●	●	●	●	●	●	●	●									●							
	Level Spreader	●					●	●	●	●									●							
Separator BMPs	Water Quality Inlet	●					●	●	●	●							●	◐	◐							
	Oil/Grit and Oil/Water Separator	●					●	●	●	●							●	◐	◐							
	Proprietary Systems	●					●	●	●	●							●	◐	◐							
LID	LID	●	●	●	●	●	●	●	●	●	●	●		●	◐	●		●	◐							

● Applicable ◐ May be applicable with careful design